

Philosophy vol. 5.
AN
ACCOUNT

OF A

Surprizing METEOR,

Seen in the Air *March* 19. 17¹⁸₁₉
at NIGHT.

CONTAINING,

- I. A Description of this Meteor, from the Original Letters of those who saw it in different Places.
- II. Some Historical Accounts of the like METEORS before.
- III. A Demonstration that such METEORS are not COMETS.
- IV. That such METEORS are not a Concourse of Vapours above our Atmosphere.
- V. That they are prodigious Blasts of Thunder and Lightenings in the upper Regions of our Air.
- VI. Observations from the whole.

By WILLIAM WHISTON, M. A. sometime Professor of the Mathematicks in the University of Cambridge.

L O N D O N :

Printed for W. TAYLOR, at the *Ship* in *Pater-Noster-*
Row. 1719.

ACCOUNT

OF

THE

REVENUE

OF THE

STATE



FOR THE YEAR

ENDING

ON

THE

1ST

JANUARY

1860

BY

WILLIAM

W. W. W.

OF

THE

STATE

OF

NEW

YORK



A N
ACCOUNT
OF THE
Surprizing METEOR

Seen in the Air March 19. 1718.



N order to afford the Reader what Light I can about this remarkable Phænomenon, I shall

I. Give him a faithful Relation of the Phænomenon it self, and that from the original Accounts of some of the most intelligent of those that saw it: (for I my self saw nothing of it:) and shall draw the proper Inferences therefrom.

II. I shall give him like faithful Accounts of other Phænomena of the same Nature, so far as they have hitherto come to my Hand.

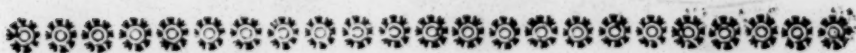
III. I shall give some Account of Dr. *Wallis's* Hypothesis about such Meteors; viz. That they are Comets; with my Reasons against that Hypothesis.

IV. I shall give a like Account of Dr. *Halley's* Hypothesis about them; viz. That they are a sort of fortuitous Collection of Vapours in the vast Void about us, which by Accident only sometimes fall into our Atmosphere, without any other relation thereto; with my Reasons against that Hypothesis.

V. I shall propose an Hypothesis of my own, for the Solution of these Appearances; viz. That they are no other than prodigious Storms or Blasts of Thunder and Lightening in the upper Regions of our Air; with my Reasons for that Hypothesis.

VI. I shall conclude with a few Observations relating to these Meteors, and their Consequences.

I. I shall give the Reader a faithful Relation of this surprizing Phænomenon it self, from the original Accounts of some of the most intelligent of those that saw it; which Accounts do here follow.



Dear Sir,

“ A Surprizing Phænomenon, was seen with us here
 “ in the Air, at Eight at Night, on *Thursday*
 “ last, much like the Description of what was lately
 “ at *Venice*; a sudden Appearance of a Globe of
 “ Fire, equal to the apparent Bigness and Bright-
 “ ness of the Sun, illuminating the whole Region as at
 “ Noon-day. After a small Pause at its first break-
 “ ing out (in the South-west, betwixt *Orion's Girdle*,
 “ and the *Great Dog*, at about 20° Elev.) it shot ho-
 “ rizontally with pretty great Velocity into the
 “ South-east, leaving a Stream of Light in the Air,
 “ and disappear'd in about 6'' from its first Appear-
 “ ance; but the Streams of Light were continued for
 “ a quarter of an Hour, separated into two or three
 “ bended

“ bended Figures, of the Colour of red mottled
 “ Fire, which also dy’d away. I should be glad to
 “ know whether any of this was seen at *London*, and in
 “ what Quarter, that we may make some Judgment
 “ of its real Distance and Altitude.

Your most affectionate Friend, &c.

*Yelvertoft, Northamp-
 ton-Shire, Mar. 21.
 1718-19.*

*N. B. This utmost Altitude of about 20 Degrees at Yel-
 vertoft, agrees well with several Observations made at
 London, which seems to have been about the same
 Distance from the Meteor with Yelvertoft: For here
 it never appear’d considerably above 20 Degrees high.*



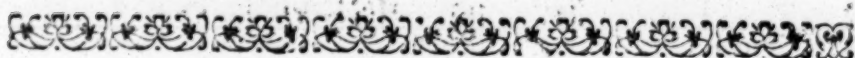
Dear Sir,

“ **N**OT knowing, whether or no, the following
 “ Account of the Appearance may be of any use
 “ to you; I thought fit to send it, that you may use
 “ it, or not, as you think fit. After the Appearance
 “ was over, there appeared a duskyish red Streak
 “ whence they said the Appearance came; it did
 “ not seem to change its Place at all, but gradually
 “ vanish’d away in about a quarter, or half an Hour;
 “ if the same was also observ’d at other Places, the
 “ Heighth and Distance of it might easily be calcula-
 “ ted. If my Globe be rightly made, it was be-
 “ tween 14 or 15 Degrees high, and about 50 Degrees
 “ from the South, counting Westward. But when I
 “ look’d at the Appearance it self thro’ the Window,
 “ it was got further South-Eastward, and could not
 “ be

" be above 10 Degrees high, and was between 37
 " and 42 Degrees from the South to the Westward.

Lyndon, Rutland,
 Apr. 6. 1719.

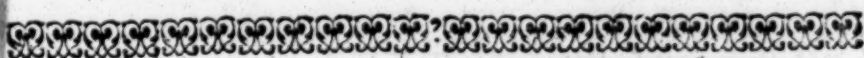
I am, &c.



Dear Sir, *Wednesday, Portsmouth, 24 March, 1718-9.*

" ON Thursday Night I saw the shaking Meteor you
 " make mention of. I was abroad in the Yard,
 " before our Commissioner's Door, and observ'd both
 " the Beginning, and almost the whole Continuance
 " of it: which I take to be thus:
 " At 4 Minutes past 8 a Clock, due West from the
 " Place I stood, about 40 Degrees high, first appear'd
 " a round reddish Ball (as near as I could guess) 8
 " or 10' Diameter, which descended slowly down-
 " wards, a little inclining to the South, and all the
 " while encreasing its Magnitude; when it came with-
 " in 20 Deg. of the Horizon, it alter'd its Motion
 " more assant to the Southward, and increas'd its
 " Brightness and Magnitude prodigiously, till its least
 " Diameter was about 26 to 28 Minutes; its Light
 " and Brightness being equal to the Sun, but of a
 " whiter Colour. (I take the Redness you mention to
 " proceed from the smoaky Air you live in.) The Air
 " was clear, except two thin Clouds through which
 " it pass'd, as if the Clouds had been heated or set
 " on Fire in that Part, and which continu'd near half
 " an Hour. Your Letter, and some other Accounts I
 " have seen, say it continued half a Minute, but in-
 " deed I guess by the Slowness of the Motion it was
 " near a Minute before it disappear'd; and when it
 " came within 7 or 8 Deg. of the Horizon my Sight
 " was obstructed at a Tar-house that intercepted. Ma-
 " ny People affirm they heard a Noise sometime af-
 " ter it like to Thunder, or a hot Iron quench'd in
 " Water: and I thought I heard such a Noise faintly,
 " ---which

“ ---which seem'd to be about *Yarmouth* in the *Iſle*
 “ of *Wight*---I have ſeen and ſpoke with ſome that
 “ were about 28 Miles farther Weſtward, who affirm
 “ they did hear ſuch a Noiſe very diſtinctly.



Aſhton near Exon, March 20. 1718-9.

“ **L**AST Night, a few Minutes before eight a Clock,
 “ we had here the terribleſt Flaſh of Lighten-
 “ ing that I believe was ever ſeen; it laſted about
 “ three Minutes, as near as I can gueſs. It was ſo
 “ great that it quite obſcur'd the Light of the Moon,
 “ tho' it was a very bright Night. There appear'd
 “ in the Sky a Stream as it were of Fire for ſome
 “ Minutes after, and at ſome Diſtance as it were a
 “ Cloud of Smoke. The Phænomenon was ſo very ſur-
 “ prizing, that I did not at firſt well know what to
 “ make of it, till after gazing at it about three or four
 “ Minutes, we heard a great Clap of Thunder, which
 “ at firſt reſembled the Noiſe of Canon, the moſt I e-
 “ ver heard in my Life.

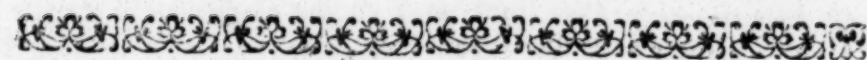


Phillack, near St. Ives in Cornwall.

“ **O**N *Thursday, March 19,* between 8 and 9 in the
 “ Evening, there appeared in the Firmament,
 “ firſt a red Star bigger than common, and did in-
 “ crease more and more, till at laſt it burſt out in a
 “ ſplendid Light, which did run from the North to the
 “ South, and continued near a Minute ſo light as it
 “ was at Noon-Day. We were all aſtoniſh'd to ſee
 “ ſuch a ſplendid Appearance this time a Night.

March 28. 1719.

I could



" I Could give you a particular Account of the Phæ-
 " nomenon, which was seen the 19th Instant in the
 " Evening ; for the Explosion was heard here, and
 " by observing the Time, between seeing the Light
 " and hearing the Sound. I have the Distance, by
 " which, with the Angle it made above the Horizon ;
 " by Trigonometry I calculate its perpendicular
 " Height to be near 40 Miles, and that it was Verti-
 " cal about *Sheepwash* or *Torrington* in *Devonshire*, and
 " that it was seen in other Countries besides *England*,
 " by reason of its great Height. I suppose the Ex-
 " plosion was not took Notice of at *London*, by rea-
 " son it would not reach the Ear in less than 12 Mi-
 " nutes after the Light.

I am, &c.

Looe in *Cornwall*, *March*

27. 1719.

N. B. *The same Author afterward gave a more parti-
 cular Account of what he observ'd about this Meteor ;
 of which the Epitome follows.*

It broke out between the two foremost Stars in the
 Square of the little *Bear*, but 2 or 3 Degrees to the
 Eastward, at the Altitude of 46° . It ran along by
 the Star in the bending of the *Dragons Tail*, and thro'
 the great *Bear's Tail*, a little below the middle Star,
 and so away towards *Cor Caroli*, and past pretty near
 it ; thence coming round again it fell down into our
 Horizon, cutting it at S. S. E. half South nearly ; but
 if any thing to the Eastward, not coming nigh the
Moon.

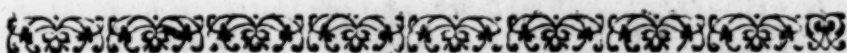
The Sound was certainly heard at *Guernsey*.

The Course was from the South to the East.

The Sound makes its Altitude 50 Miles nearly.

N. B.

N. B. That this Author's own natural Thoughts of the Meteor's Altitude, from his Observations, was between 38 and 40 Miles; tho' in this Letter he seems willing to extend it to about 50 Miles: And that another Auditor near Lempster in Herefordshire, estimated the Interval between the Light and the Sound by a Watch, and found it about 10 Minutes: Which gives about 40 Miles of Altitude also.



From Exeter.

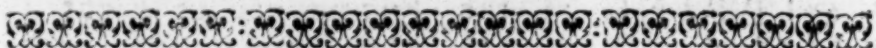
“ **SITTING** at the Fire-side about Eight a
 “ Clock at Night, the Moon shining then very
 “ bright, and the Sky clear, not the least Cloud to
 “ be seen, on the sudden there appeared a very great
 “ Light far brighter than the Sun at Noon-day, ac-
 “ companied with so great an Heat, that the Arm of
 “ mine which was next to the Window burnt for ma-
 “ ny Hours as if it had been scalded. There was
 “ so great a Smoak, that I thought, and so did ma-
 “ ny others, that all the Ground had been on Fire;
 “ but we soon perceived that it was in the Sky. The
 “ Light came from the North-East (which is the Si-
 “ tuation of our Room) it seem'd to go very swift
 “ over our House, and so over the Church to the
 “ South-West. In a very short time it returned back
 “ again (but not near so big) and as it appeared to
 “ us, broke just over the Church, like a Sky-Rocket,
 “ but so large, and with so many Sparks of Fire,
 “ that it left so great a Redness (seemingly to us just
 “ the breadth and length of the Church) that it look-
 “ ed like all Blood, and gave the same Reflexion
 “ into the Rooms on the other side of the House.
 “ Some Minutes after this (I should think at least
 “ seven or eight) we heard a Report like a great
 “ Canon (much greater than ever I heard.) It shook
 “ the House and Windows very much. About a

B

“ Mi-

“ Minute after, there went off to our thinking, a-
 “ bout thirty, not so big. They sounded just as
 “ the Tower-Guns did, when we were in *Mincing-*
 “ *lane*, but shook the House and Windows much
 “ more. After this, we heard smaller, with a Sound
 “ like Drums and Trumpets, which lasted but a short
 “ Time. After the Light went off, although the
 “ Moon seemed to shine bright; for about two Mi-
 “ nutes, it was so dark, that we could not see our
 “ Hands.

N. B. *That Resemblance of the latter Sounds to a
 Drum, I have heard confirm'd by more than one Au-
 ditor besides.*



—“ I Should not trouble you any longer, but
 “ that we had a very extraordinary Meteor
 “ last *Thursday* Night, the Nineteenth of this In-
 “ stant. I was walking in *Stephen's Green*, and saw
 “ it distinctly, about 20' after Seven, the Moon was
 “ pretty bright, when on a sudden, it was in a
 “ Manner extinguish'd by a prodigious Blaze, two
 “ or three Times bigger than its Orb, of very white
 “ clear Light. It began about *E. S. E.* moved for-
 “ ward to the *S.* for about 20 Degrees extreamly
 “ swift, and then ended in a Point. It shot like a
 “ Cone, left a Train of reddish Light, which soon
 “ vanish'd, for all was over in eight or nine Se-
 “ conds. The Appearances of Meteors are so sudden,
 “ and their Continuance so short, that they are sel-
 “ dom observ'd, and hard to be describ'd. It was
 “ seen at *Drogheda*, but I have heard no Account of
 “ it further off.

Trinity-College, Dublin,
 24. Mar. 1718.

London,

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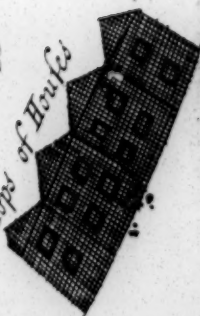


B



A

Top of Houses



Orion



30

20

10



London, 19 March, 1718-9.

“ **C**OMING Home this Evening, about 8 a Clock,
 “ thro’ *St. Paul’s Church-Yard*, on the North side,
 “ my Face being Westward, I discern’d in the Sky a
 “ large Ball of Fire, at about 20 or 25° height from the
 “ Horizon, and bearing about *W.* and by *N.* or *W.N.W.*
 “ when I first saw it: It seem’d to be as large as the
 “ Moon at Full, with a pale blewish Light, and to
 “ have little Motion; but in a Moment it was thrown
 “ into the Shape of a common Meteor, the Head di-
 “ minishing ’till it was all turn’d into a long Stream
 “ of Light, which extended to about 50 or 60° in the
 “ Heavens toward *S. W.* and on an Angle of about 10
 “ or 15° from a Parallel with the Horizon, but the
 “ broadest part of this Stream was at least double to
 “ the Diameter of its first Appearance, and made so
 “ strong a Light while it was in its greatest Extent,
 “ that for a Moment the Moon, which was above a
 “ Day past the first Quarter, and all the Stars, seem’d
 “ to disappear by the Superiority of this new Light;
 “ and at that Moment one might have read the
 “ smallest Print by it. While it was throwing it
 “ self into this beautiful Stream, I thought I heard a
 “ Noise of hissing, like what is made by the flying of
 “ a large Rocket in the Air, but I heard no other
 “ Noise. The Light, tho’ very strong, was very a-
 “ greeable to the Eye, and as it vanish’d it turn’d
 “ from a bright Pale to a Yellowish Colour. The Du-
 “ ration of the whole I do not think was above half
 “ a Minute, and of the greatest Light not the tenth
 “ part of a Minute.

*An Account of the late Meteor, as it appear'd
at Norwold in Norfolk, about nine Mile
North West of Thetford.*

March the 19th, 1718-9.

“ **A** Bout a quarter past eight in the Evening, the
“ Sky being very clear, and the Moon be-
“ tween a Day and two Days past the first Quarter,
“ there appeared a bright Star a little West of *Orion*,
“ and somewhat higher than his Belt; at first it
“ stood still, but in a few Minutes began to glide
“ slowly, and almost parallel to the Horizon, and in-
“ creas'd in Velocity and Bigness, till it came to be
“ between the Belt and Sword of *Orion*, by which
“ time it was as big as the Moon in the Horizon,
“ and burst and fell down very swift with a Train of
“ Light about the Breadth of a Rainbow, which
“ reached from *Orion* to the Horizon, and gradually
“ vanished in small Sparks like a Rocket. It was
“ a Minute or more before they were quite extin-
“ guished; the Light was so great as to extinguish
“ that of the Moon; the Colour was very White and
“ Blue, like the common Composition of Stars in
“ Rockets; and several Persons, both Abroad and
“ in the House, were positive of hearing distinctly a
“ Noise, like a great Number of Rockets going off
“ together.

SIR,



S I R,

Worcester, Mar. 28. 1719.

" ON Thursday the 19th of March, 1718-9, at 8h
 " 11' so estimated by a Pendulum Clock, com-
 " par'd the next Day with an Horizontal Dial made
 " at London; but without allowing any thing for its
 " deviating a little from the true North to the East-
 " ward. At that Time, I say, I was walking in my
 " Chamber, with my Face towards the Window,
 " made of a clear Glass, from which I was at about
 " three or four Foot Distance, when I saw on a
 " sudden, through it, at the South West, a very great
 " Flash of Fire, express'd in the Figure by A B. I
 " open'd instantly the Window, from whence I had
 " a clear Prospect of that Part of Heaven, except a-
 " bout three or four Degrees next to the Horizon.
 " The whole Space A B, was fill'd up in an Instant,
 " with a very bright Flame, which might last about
 " four Seconds of Time, and perhaps not above two
 " or three Seconds, and so did suddenly vanish, lea-
 " ving in the very same Place A B, a small thin
 " Cloud, of a grey Colour, somewhat reddish. At
 " the same Time, a small Fire continu'd from B, to
 " run leisurely along the Line B E C, leaving all a-
 " long behind it a grey Stream, about 15' broad.
 " The Line B E C, was very uniform, a little bend-
 " ing towards *Sirius*; but the Edges or Sides of it
 " were rough, and not uniform as the Line it self, this
 " Part being in some Places a very little broader or
 " narrower than in others. The whole Figure A B E C
 " resembled exactly a Rod or Staff. The Fire might
 " be about five Seconds in describing the Line B E C,
 " having its handle about 1d broad in A B, in a di-
 " rect continued Line with the rest. While the Line
 " B C was a forming, it look'd exactly as if a Roc-
 " ket, or a Bomb, had been thrown in our Neigh-
 " bourhood. The visible Remains of this whole Phe-
 " nomenon

“ nomenon continuing about a Quarter of an Hour,
 “ gave me an Opportunity of delineating it immedi-
 “ ately, with the Stars about it. But because of the
 “ Impossibility of making a plain Figure, represent-
 “ ing truly so great a Part of Heaven, unless it be
 “ in the Nature of a Projection, I have reduc'd here
 “ my Figures to a Planisphere, whereof the *Zenith*
 “ is the Center, the Eye being suppos'd in the op-
 “ posite Point, in the Surface of the Sphere. How-
 “ ever, I have placed the Stars only by Estimation,
 “ as my Figures directed me, without using any Ta-
 “ ble of the Stars, &c. In my Draught, I suppos'd
 “ for a Foundation, that the higher-most Star in *O-*
 “ *rión*, was about 30d high, as I judg'd it to be by
 “ Estimation. The Situations and Proportions are
 “ very near the Matter in the Figure, including in it
 “ *Procyon*; at least they are so near the Matter, that
 “ from this Observation, and any tolerable Observa-
 “ tion beside, made in *England*, &c. from any Place
 “ fit for that Purpose, it may be very safely determi-
 “ ned how high this Phenomenon was from the Sur-
 “ face of the Globe; what Places it was perpendicu-
 “ lar upon; what was its true Bigness and Figure,
 “ and real Swiftness in Burning; and how much it
 “ was leaning at its Extremity C, either towards
 “ *Worcester* or from it; and lastly, whether the Line
 “ A B E C, was really uniform in it self, and almost
 “ streight; or, whether it only seemed so to me, as
 “ being at *Worcester*. As soon as we knew that this
 “ Phenomenon had been seen at *London*, and that
 “ there, as they said, it gave as great a Light as in
 “ the Day Time, I concluded that it had been seen
 “ in *Cornwall* too. The printed Account, in a Letter
 “ from *Plimouth*, March the 20th, though very gene-
 “ ral, and upon that Account imperfect; yet enables
 “ us to guess very well at the Height and Bigness,
 “ and Situation of the bright Part A B, of this Phe-
 “ nomenon; and that with so much the more Cer-
 “ tainty, because the Part A B was very near the *Ze-*
 “ *nith* at *Plimouth*.

N. B. That this curious Author's Computation of the middle Point of the larger Part of the Meteor, or of it when it was bursting to Pieces in its Explosion, is scarce $22\frac{1}{2}$ Miles. But then, that is only on the Supposition that that Point was perpendicularly over Plimouth, as some imperfect Accounts at first said; whereas the Observations by the Stars which are among the exactest I have heard of, compar'd with others already set down, will prove, That that Point was not then over Plimouth, but rather over the middle of Bretaign in France; which greater Distance will by the same Method of Computation, afford us near forty Miles Altitude, which agrees with the most accurate Observations of the Interval, between the Sound and the Light, and with the rest of the Observations by the Stars already set down; and indeed, with the Generality of the Observations every where that I have met with; and may therefore, I think, be entirely depended on by us.

NOW the proper Result of all these Accounts, and of many others that I have seen and heard, is this; That this Meteor was compos'd of Nitro-sulphureous Vapours, or Exhalations, collected first together in the upper Regions of the Air, over Radnorshire in Wales, or the neighbouring Counties: That it was at first smaller, and to Appearance like a large Star only; that it gathered more Fewel as it rolled along, and grew larger and larger all the Way; that its Course was nearly Parallel to the Horizon, and its Direction nearly South, or a very small matter towards the South-West: That by the time it came to be Vertical, between Cardiff in Wales and, and Minehead in Somersetshire, over the Severn Sea, it was become vastly large and bright, so as to exceed the Noon-day Sun in Splendor, near that Line along which it pass'd, and

to equal its apparent Magnitude also : That it proceeded in this manner quite over *Devonshire*, but much nearer the Eastern Limits of it, than the Western : That it past almost perpendicularly over the City of *Exeter*, and so over the *British* Channel, till it came over *Bretaign* in *France* : That all this while its Magnitude and Light were not impair'd ; that it made a hissing Noise like a Rocket all the way, and spread a prodigious and continued Lightening, even to the utmost Limits of the whole Horizon : That upon its coming near to *Bretaign* in *France*, it began to burst to Pieces and dissolve, with a prodigious Noise, which endur'd for some time, answering to the time of its bursting to Pieces, all the while it was dissolving : That it left a large Smoke, or sort of Cloud along all that Space where it burst, above 100 Miles in Length, over our Channel and *Bretaign*, and perhaps somewhat further towards *Bell-Isle* : That the Noise of this Explosion was heard all along its Course, and 50 or 60 Miles at least on both Sides of it ; first like a vast Number of great Guns discharg'd together ; and then like the rattling or interrupted Noise of Drums ; such as are in both Cases usual in and after great Claps of Thunder : That this Meteor, while it was dissolving, seems to have sent out lesser Streams of Light, backwards towards *Wales* from the North-end ; and backwards towards *Exeter*, from the South-end, before it intirely vanished : After which, certain Traces or Streams of the fiery Vapors continued for a quarter of an Hour, as Marks where it had passed : That this Meteor must have been about 38 or 40 Miles in perpendicular Height from the Earth all along, tho' perhaps somewhat lower towards its dissolution : That it went from *Radnor* in *Wales*, to the utmost Parts of *Bretaign* in *France*, or about 300 Miles, in 7 or 8" of Time ; or at the Rate of above 2000 Miles in a Minute : That it must have been visible, wherever Clouds did not interpose, within the Compass of an Oval, whose longer Axis, drawn nearly through *Radnor* and *Bell-Isle*, must have been about 1400 Miles, and its lesser at right Angles thereto about 1100 Miles, *i. e.* through all

all *Great Britain* and *Ireland*; through *Holland*, *Flanders*, the *Western Parts* of *Germany*, all *France*, and the *North-East Parts* of *Spain*, with *Lombardy* in *Italy*: And that it was really about a *Mile* in *Diameter*: That therefore it was truly a *Meteor*, or what properly, during its whole *Course*, was within the *Limits* of our *Atmosphere*: As both the hissing *Noise* during its *Passage*, and the terrible *Thunder* afterwards, do plainly demonstrate. It being well known that no *Sound* can be propagated, but through the *elastical Medium* of the *Air*. The remaining *Traces* of this *Meteor* left in the same *Air*, and seen therein for a quarter of an *Hour* after it was gone, are also evident *Demonstrations* of the same thing.

II. I shall now give the Reader faithful Accounts of other *Phænomena* of the like Nature with this *Meteor* before us, so far as they have hitherto come to my Hand.

(1.) The first *Meteor* of this kind that I have met with as seen in this last Age (for of the elder Ones we have generally such imperfect Accounts, and that chiefly as Omens only, that little *Light* can be gathered from them, to any sober Enquirer's Satisfaction) is that mentioned by *Hook's Posthumous Works*. p. Dr. *Hook*, in these Words.

A like *Phænomenon* to that in *Italy* 200. 1676, says he, was some 10 Years before observ'd, both here in *England* and in *Holland*. It was seen by *Sir Rob. Murray*, if I mis-remember not, and by *Mr. Shortgrave*; and I think, also by *Monf. Hugen* in *Holland*. It was as big as the *Italian Meteor*, and was judg'd to be of an exceeding great Height in the *Atmosphere*; being seen at Places so far distant at the same time. It appeared first about the *North-East*, and passed by the *North-West*; not rising, as I remember, so high, as 10 Degrees above the *Horizon*.

(2.) The second Meteor of this kind, that I have met with was, in the Words of *Ibid.* p. 199. the same Dr: Hook A *Fax*, or *Lampas volans*, observ'd after Sun-set, the 1st of March 1676, at *Fau* — by *Petrus de Lavina*; at *Rome*, by *Monfieur Anzout*; at *Florence*, by *Matthias del Arpi*; at *Venice*, by *Jo. Jacob Hertz*; and in several other Cities of *Italy*: In all which it was seen also by very many others: And at the same time also, was observ'd in the lower Parts of *Germany*; as at *Triers*, by the *Jesuits* there; Places very far distant from one another; and yet the Time and Manner of the Appearance in all was much the same: It seemed to rise out of the North-East, and to pass by the Meridian to the South-West Parts of the Heavens; near the same Tract that the Sun had gone that Day; and disappear'd behind thick Clouds, where, with a mighty Noise, it was suppos'd to be blown to pieces and dispers'd. It appeared about the Bigness of the Full Moon, and left behind it a Tail about three Diameters, of a reddish Flame at first, but turning blewish towards the last. It lasted about a Minute or two. Its Noise at last was like the Noise of an Earthquake at a Distance, and made the Glass in the Windows shake. From the comparing several Observations 'twas suppos'd about 90 Miles high, and near a Mile in Diameter.

N. B. This must, in all Probability, be the very same Meteor which *Montanari*, the great Mathematician at *Bononia* saw, and exactly measur'd; of which presently. For it was seen in the same Year, in the same Month, at the same time of the Night, in the same Countries, and passed along the very same Course, and was of the same Bigness; as will appear immediately. How the Day of the Month, March 1 for March 21, comes to be mistaken, I do not certainly know; only if they were both meant of the same Style, it is very easily accounted for.

N. B.

N. B. The real Altitude therefore of this Meteor was not 90 Miles, as 'tis here in general stated ; but about 38 Miles rather, as Montanari particularly measur'd it ; as we shall now see.

(2.) The Third, or rather the same Second Meteor of this kind I have met with, is that on March 21. 1676, about an Hour and three quarters after Sun-set, exactly, to a few Minutes, within two Days of 43 Years before the last ; which was an eminent one indeed, and was particularly observ'd at Bononia, by that great Mathematician Montanari. " It came over the Adriatick, says Dr. Halley in his Extract from him, " as from Dalmatia ; cross'd over Italy ; and became nearly Vertical to Rimini and Leghorn : Its perpendicular Altitude was, at least, 38 Miles ; it made a hissing Noise as it pass'd, which was heard near its Course : From Leghorn it went off to Sea, towards Corsica : And at Leghorn it was heard to give a very great Blow, beyond the Noise of a great Cannon ; with a Rattling, which continued about a Minute or two. Its Velocity was not less than 160 Miles in a Minute : It was of an oval Shape : At 50 Miles Distance, its lesser Diameter was as large to the Eye as the Moon's Diameter, and its larger above half as big again ; so that its real lesser Diameter was above half a Mile, and the other more than three quarters of a Mile.

(3.) The next Meteor of this kind, was that mentioned by Dr. Wallis, Sept. 20. 1676. about 7 at Night, which he describes thus ; " There appeared a sudden Light, equal to that of Noon-day, so that the smallest Pin or Straw might be seen lying on the Ground ; and above in the Air was seen, (at no great Distance, as was suppos'd,) a long Appearance as of Fire ; like a long Arm, with a great Knob at the End ; for so it was described to the Dr. (who did not himself see it ;)

“ shooting along very swiftly: And at its disappear-
 “ ing seem’d to break into small Sparks or Parcels of
 “ Fire, like as Rockets, and such artificial Fire-works
 “ in the Air are wont to do. ’Twas so surprizing,
 “ and of so short continuance, that it was scarce seen
 “ by any who did not then happen to be abroad; and
 “ lasted only while one might tell 15 or 20 at most.
 “ It was seen in most of the Southern Counties of
 “ England, at or near the same time. Nor could the
 “ Dr. satisfy himself which way this Meteor went.

(4.) The next Meteor of this kind is that mentio-
 ned by *Kirchius*, as seen at *Leipsick*,
Philosophical May 22. 1680. “ about three in the
Transact. No. “ Morning, as descending in the North,
 341. “ and leaving behind it a long white
 “ Streak. It was seen at several Places
 “ 160 *English* Miles distant from *Leipsick*, but met with
 “ no good Observers: as it is no wonder at that time
 “ of the Night.

(5.) The next Meteor of this kind, was seen by
Kirchius himself at *Leipsick*, July 9.
Ibid. 1686. “ at half an Hour past One in
 “ the Morning: which mov’d but ve-
 “ ry little for half a quarter of an Hour; its Diameter
 “ was about half as large as that of the Moon: Its
 “ Light at first was such, you might read by it; but
 “ by degrees it vanished away. It was seen in many
 “ Places at a considerable Distance from *Leipsick*; and
 “ and was at least 30 *English* Miles high.

(6.) The next Meteor of this kind, that I have met
 with, was seen by *Mons. Feuillée*, a cu-
Feuillée’s Jour- rious *French* Observer in the *South-Sea*,
nal. p. 116. May 13. 1708. about Nine at Night.
 His Words are these: We saw, says
 he, a flying Fire, which being lighted all of a sudden
 perfectly resembled the Planet *Venus*; it remain’d in
 the Place where it first appear’d for a Minute and a
 half. I took care to observe it, by comparing it with
 the nearest of the fixed Stars. On a sudden it exten-
 ded it self, and filled all the Horizon with Light, in
 such a manner, that we might have discover’d a Ship
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in any Part of the Horizon. This Light thus spread, lasted but a short time.

(7.) The next Meteor of this kind, that I have met with, was seen by the same Observer, a little above two Months after the former, in the same Voyage, July 17. 1708. *Ibid.* p. 199.

His Words are these; In the Night, I saw a Phænomenon very Particular, almost like another that I had observed in the Northern Parts. As Astronomy has been always my chief delight, I was looking up to the Heavens to observe the Stars that make all its Beauty, and which compose the Southern Constellations. When I perceived on a sudden a Star much greater than *Jupiter* and *Venus*, which continuing more than two Minutes in the same bigness, and without losing any thing of its Light; I began to think, from its duration, that it was a *New Star*. — Whilst I was employ'd in observing this New Phænomenon, it happen'd that this Luminary, as I could properly call it at that time, took Fire all on a sudden; and, --- extending it self throughout all our Hemisphere, discover'd it to us intirely, and made us see to the furthest Limits of it, so that we might have seen a Ship at a great distance; and, if I may venture to say it, even in any Part of the Horizon; from whence, one may judge, how very great this Light must have been.

(8.) The next Meteor of this kind, was seen in *England*, July 31. 1708. between 9 and 10

a Clock at Night. "It was between 40 *Philosophical*

" and 50 Miles perpendicularly high; *Transact.* No.

" and that over *Sheerness*, or the Buoy 341.

" on the *Nore*. It was seen at *London*,

" and in *Suffolk*, [and no doubt in the neighbouring

" Parts of *England*.] It appear'd at *London* to move horizontally, from *E. by N.* to *E. by S.* and in *Suffolk* it appear'd as sliding obliquely downwards. It was very bright at its first Appearance, sufficient to take up a Pin, and but a little inferior to the Light of the *Moon*; and it died away at the End of its Course, leaving a pale whiteness in the Place, without any Noise.

This

This is an Epitome of the several Histories of Meteors of this Nature, that I have yet met with in the last Age.

(9.) Nor do I know of any the like Meteors seen since, till this before us; Unless we reckon that mention'd in our *Gazette*, and News-Papers, as seen over *Venice*, Feb. 22. last. But since it does not yet appear that this was seen at any considerable Distance, perhaps it might be somewhat of another Nature, and such a Meteor as is several times seen in our lower Air.

III. I shall now give some Account of Dr. Wallis's Hypothesis about such Meteors; namely, that they are Comets: with my Reasons against that Hypothesis.

Now as to this Hypothesis, take it in the Doctor's own Account, *Philos. Transact.* No. 135. as set down by Mr. Lowthorp, in his Abridgment of those Transactions, "The Breadth of Ground, says he, where this Meteor, "Sept. 20. 1676. was seen; was too much for any ordinary Meteor in our lower Region of the Air to be "seen in at once; which argues that either it was "higher than it was imagin'd to be, (tho' the Light of "it reached the Earth,) or else that it had a very "swift Motion. This made me then conjecture, that "it might be some small Comet, whose *linear trajectory* "passed very near our Earth, or upon it; and might, "when farther distant from us, appear as a Comet. "And that Comet, which hath since appeared in April "and May, confirms me in the same Opinion; which "I conjecture may be the very same which passed by "us in September last. So far Dr. Wallis. Now tho' this Hypothesis might be tolerable when it was written, before the true Theory and Motions of Comets were discover'd by Sir Isaac Newton, and when the Dr. seems not to have been acquainted with any other Appearance of the like Nature, yet will it now no way bear. The Reason is obvious, viz. because these Meteors have no manner of Resemblance to Comets at all, either

either in their *Bigness*, which is usually about or under a Mile in Diameter; while Comets are usually of the Bigness of Planets, or several thousand Miles in Diameter: or in their *Nature*, which is that of Light or Fire; while Comets are ever as dark or opake in themselves as the Planets; or in their *Trajectory*, which in Comets is a Line descending to, and ascending from the Sun, and nearly parabolical; while these Meteors still pass in a manner parallel to the Earth's Horizon: or in their *Velocity*, which in these Meteors is very different, but in Comets near the Earth is always the same; or in their *Atmospheres*, of which these Meteors are still destitute; but which almost always encompasses the Bodies of Comets, and that to a vast Distance; or in their *Tails*, of which we have no Signs in these Meteors, but which almost as certainly accompany the Comets as do their Atmospheres themselves, as indeed derived from them: or in their *visible Duration*, which in these Meteors is seldom many Minutes, frequently not many Seconds, but in Comets is usually many Days or Weeks, nay sometimes Months. To say nothing of the Impossibility there is that the same Comet which was near the Earth in *September* should continue near it, or approach again to it seven or eight Months afterwards, as the Dr. supposes; when the Earth was then not very far from the opposite Point of its Orbit, or more than 100,000,000 Miles distant from its former Place. 'Tis therefore certain that these Meteors cannot belong to the Species of Bodies we call Comets.

IV. I shall now give a like Account of Dr. Halley's Hypothesis about these Meteors; viz. That they are a sort of *fortuitous Collection of such Vapours* in the vast Void about us, as by Accident only fall into our Atmosphere, at certain times; without any other relation thereto; with my Reasons against that Hypothesis.

Dr. Halley gives us his Hypothesis, *Transact. No. 341. p. 162.* in these Words, "I have, says he, much considered

" sidered this Appearance, and think it one of the
 " hardest things to account for that I have yet met
 " with in the Phænomena of Meteors; and am in-
 " duced to think that it must be some Collection of
 " Matter form'd in the Æther, *as it were by some fortui-*
 " *tous Concourse of Atoms*; and that the Earth met
 " with it as it pass'd along in its Orb, then but newly
 " form'd, and before it had conceiv'd any great *Impetus*
 " of Descent toward the Sun. For the direction of that
 " over *Italy* was exactly opposite to that of the Earth,
 " that is, its Course was from *W.S.W.* to *E. N. E.* where-
 " fore the Meteor seem'd to move the contrary way,
 " and besides, falling into the Power of the Earth's
 " Gravity, and losing its Motion from the Opposition
 " to the Medium, it seems that it descended towards
 " the Earth, and was extinguish'd in the *Tyrrhene Sea*,
 " to the West South West of *Leghorn*. The great Blow
 " being heard upon its first Immersion into the Water,
 " and the rattling like the driving a Cart over Stones,
 " being what succeeded upon its quenching; some-
 " thing like which is always observ'd upon quenching
 " a very hot Iron in Water. Thus far Dr. *Halley*.

Now the plain Reasons why I can no way agree to this Hypothesis, are these:

(1.) 'Tis very evident, there neither is, nor can be
 any such *Collection of Vapours form'd in the Æther, as it*
were by some fortuitous Concourse of Atoms, and without
Gravity, which the Dr. here supposes as the Foundati-
 on of his Hypothesis. Such a Mass of Matter in an
 immense Vacuum, without any Gravitation to the
 Sun, the Dr. well knows is a mere Chimæra, contra-
 dicting all the certain Philosophy in the World. Nor
 can it be possibly suppos'd but by immediate Creati-
 on out of nothing, or by it self emerging out of no-
 thing, without being created, before it could be thus
collected together; neither of which Notions, I imagine,
 will be justify'd by the Dr. himself, in his cool
 Thoughts. But let us for once suppose such Masses of
 fiery Matter frequently collected in the Æther, tho'
 we know they cannot possibly be so collected; yet is
 it evident,

(2.) That

(2.) That if such Meteors as these were thence deriv'd, they would appear at all sorts of Distances, within the reach of their Light, or within the reach of a thousand or two of Miles: For a Body so large, and a Light so nearly equal to that of the Sun, as these have, would certainly be visible so far; whereas it does not appear, that any of them have been yet seen so far as 50 Miles from the Earth.

(3.) These Meteors would, on such an Hypothesis, be equally of all Magnitudes whatsoever; such fortuitous Productions, if such there were, going for certain by no Rule at all: Whereas those above-mentioned seem never to have been of a larger Size than this last, which was about a Mile in Diameter; and the rest of no very great Variety therefrom.

(4.) They would and must all, upon this Hypothesis, as the Dr. allows, in these Climates, go nearly with the same Velocity, and in the same Course, as to our Sight, *i. e.* from East to West; because their Motion being only apparent, must be deriv'd from the Earth's Motions, Annual and Diurnal, which are from West to East, both the same way, and of one tenor. Whereas these Meteors go uncertainly, and without any regard to those Motions at all. Accordingly, this last went almost directly South, and much faster than even the annual Motion it self; entirely contrary to this Hypothesis.

(5.) If these Balls of Light or Fire were such Masses as did not belong to our Atmosphere, but only pass'd through it accidentally, as Dr. *Halley* supposes; why do we not see them before our Atmosphere reaches them? and after it leaves them, whenever it does so, as well as while they pass through it? not to say, that the first Collection, as well as last Dissolution of these Meteors, does, by the Observations themselves appear, both to begin and end within the Limits of that Atmosphere, and thereby shew they properly belong to it, entirely contrary to the Dr's. Hypothesis.

(6.) If this was the Origin of these Meteors, why do they seldom or never hit against the Body of the
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Earth it self, or terraqueous Globe, but against the Air? Or rather, why does the Body of the Earth or terraqueous Globe, seldom or never hit against these Meteors, but only the Air, nay the upper Regions of the Air? Why do these Meteors seldom or never destroy a City, or burn up a Fleet, as well as pass over our Heads, without doing us any Damage? The Earth's Diameter is near 8000 Miles; the Altitude of any sensible Atmosphere, as Dr. *Halley* has fully prov'd, is not 50 Miles, and thence the Diameter of the whole, not 8100 Miles. Now the Disk or biggest Circle of the larger Sphere will be to the Disk or biggest Circle of the smaller here, as the Squares of those Numbers, or nearly as 40 to 41, and the Difference of those Squares, or the Hazard of such a Ball's hitting against the Earth, or the Atmosphere, will be as the smaller Number to the Difference of those Numbers, or as 40 to 1. Nay, since only the upper Regions of the Air, for in them alone these Meteors have been seen, are to be compar'd with the Earth; it will appear on a like Calculation, that the Hazard of such a Ball's hitting against the Earth, is to that of its hitting against the upper Parts of the Atmosphere, at least as 100 to 1, or that, one with another, 100 of these terrible Meteors will hit against the Earth it self, and destroy all before them, for one that hits against the upper Regions of the Air; and above 100 will hit against either the Earth, or lower Regions of the Air, for one that hits against those upper Regions; to which yet we see Providence usually, if not always confines them. I say that these Meteors seem seldom or never to hit against the terraqueous Globe it self.

'Tis true, Dr. *Halley* imagines, that those which go off with a Report, as the principal certainly, and all probably do, must fall into the Sea, and in quenching make that Noise we hear after these Meteors, and that one of those already mentioned descended towards the Earth, and was extinguished particularly in the *Tyrrhene Sea*. But then, since that is a bare Hypothesis, and without any Fact or History to support it, nay contrary to the known Observations themselves,

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selves, while Dr. *Hook's* Account, set down as above, assures us, that the *Italian Meteor* which Dr. *Halley* suppos'd to fall into the Sea, only set behind a Cloud, I shall not need to confute it any farther. In short, this whole Hypothesis seems to me so very weak, that it can only be excus'd and forgiven on account of the many other noble and truly excellent Performances of its Author. Tho' I confess I think this Author should not easily forgive himself in one thing, I mean that odd Insinuation here made, as if there might be a *formation of Meteors*, at least, if not of other Bodies also, *as it were by some fortuitous Concourse of Atoms*; which, I venture to say it, is, at this time of Day especially, as little agreeable to sound Philosophy, as to all the Notions we have of Providence and Religion.

V. I shall now propose a New Hypothesis of my own, for the Solution of these Appearances, *viz.* That they are no other than prodigious Storms, or Blasts of Thunder and Lightening in the upper Regions of our Air: With my Reasons for that Hypothesis.

Having therefore now given my Reasons, why I cannot at all go into the Notions of either Dr. *Wallis*, or Dr. *Halley* in this Matter; I come to my own Hypothesis, or Conjecture; so I shall yet call it: Tho' I confess the Evidence for it seems to me so strong, that, if the future Phænomena of this kind do confirm it, as much as I think those do which we are hitherto acquainted withal, it may perhaps hereafter merit a higher Denomination.

My Opinion therefore concerning such Meteors, is plainly this, That they properly deserve that Name of *Meteors*, as belonging directly to our Atmosphere; and that they are no other than prodigious Storms or blasts of Thunder and Lightening, of such Thunder and Lightening, as is proper and peculiar to those more elevated Regions of our Air in which they appear. In order to the true understanding of my meaning in which Hypothesis, the Reader must observe, that the Air at 39 Miles high, is, by Dr. *Halley's* Cal-

culation, agreed to now by all, about 2000 times rarer and weaker than it is here with us ; that a Storm or Blast of this kind, even here below, seems to be a Collection of nitro-sulphureous and fiery Vapors, into a sort of a rolling Globe, or Whirl-wind of Fire ; that this is that *Fulmen* or *pernicious Lightning*, which is so terrible in its Effects ; that it is still accompanied with that *Fulgur* or *Flash*, we call *common Lightning*, and with that *Tonitru*, that great rolling or rattling Noise which we call *Thunder* ; and that such Collections of nitro-sulphureous or fiery Vapors may be vastly larger before they are limited or determined by the external Air, which by rarefaction is excluded from within, where it is so vastly rare, than the like Collections are with us : That the prodigious Velocity of such Balls may also be better suppos'd in such a rare and thin Medium, than in ours, so much denser and thicker ; and that so much the greater Quantity of nitro-sulphureous Vapors will be spent and exhausted by one such Ball or Blast, than by one of ours here below, as it is in Magnitude greater ; which will also render such Phænomena in the same Proportion rarer and seldomer in any certain region there than here.

These things being supposed, which appear to me very reasonable ; it will be a natural Account of these Phænomena, if we esteem them direct Blasts of this kind. For certainly these Fire-balls, as we have shew'd, are still within the Limits of our Air, the Place of such Meteors : They have all the three Characters of such, and only of such Blasts ; the *Fulmen*, the Ball or Whirlwind of pernicious Lightning ; the *Fulgur*, the Flash or common Lightning ; and the *Tonitru*, the Noise or Thunder. They go with a Swiftmess which we have no Examples of here in any Meteors, unless it be in such Thunder and Lightning. So that I do not see room for much doubt in the Case. 'Tis true, the rareness of the Air above, will, as in all like Cases, greatly deaden and damp the sound of the Thunder ; as no doubt it does ; but this is no great difficulty here, because the prodigious Vastness of the Blast, if it be at all so much more violent as

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the Fire-ball is greater in Quantity, as it must naturally be, will abundantly make up that Defect, and afford us a sufficient Sound notwithstanding; as will appear presently by Calculation. I do not indeed know any mechanical Power, that in such a fluid Medium as the Air, can cause so sudden, and so prodigious a Collection of fiery Vapors, and carry them in one particular horizontal Direction with such an immense Velocity as we here meet with. But then, I am equally at a loss for the mechanical Cause of the strange Effects of Gun-powder, and of the like Cause of the Velocity, Force, and Direction of Thunder and Lightening, and indeed of many other Powers of Nature; of whose Existence, yet, there is no manner of Question. So that if it appear, that this Meteor is no other than a Blast of Thunder and Lightening, such as is proper and peculiar to the higher Regions of the Air, as I hope it now does; we ought not to object this Difficulty against the present Solution, which is built on the known Properties of nitrosulphureous Vapors in all such Explosions, whether of Gun-powder below, or of Thunder and Lightening a little above.

And now, for a Conclusion, I shall Observe a few things which may, on this Occasion, deserve the Attention of the Curious.

Note (1.) That such a Collection of nitrosulphureous Vapours as this, of a Mile in Diameter, is to such a Collection of the like Vapours in the largest Thunder-Storms here below, of scarce 20 Feet Diameter, as the Cubes of those Diameters, or as 16,000,000 to 1. So that the Explosion or Force of such a Ball of Fire as this would naturally, as to Light, Sound, and Strength, be in the same Proportion also. Whence it is questionable, whether if all the Gunpowder now in the World were laid together, and fir'd at once, it could make an Explosion equal to this before us.

Note (2.) That therefore it is no Wonder that the Sound of this Explosion was heard at the Distance of at least 80 or 100 Miles from the Explosion it self, even through that upper Air, where it is about 2000 times rarer,

rarer, and therefore in the same Proportion weaker than it is here below.

Note (3.) That therefore if this Ball of Fire had been directed downward, and come into our lower Air, and been there exploded, its Sound, at the same Distances, would have been about 2000 times as great as it now was, So that besides the sad Desolation that might arise from the Ball of Fire, which would have been vastly sudden and terrible, the very Sound or Concussion of the Air would it self have been exceeding dreadful, and very fatal also to all the neighbouring Animals, Trees, and Buildings whatsoever. Some of the smaller *Meteors* of this kind afford no Sound at this Distance; but the larger sort, of which the last was the Principal, did so always to a great Degree, as the foregoing Histories inform us.

Note (4.) That therefore a smaller *Meteor* of this sort, or such as some of the foregoing Histories describe, if it should descend to the Earth, would be abundantly sufficient utterly to destroy a particular City; and such an one as this, no small part of a County, and that in an instant, without giving the least room for foreknowing, preventing, or escaping from the same.

Note (5.) That we know of no mechanical Causes that can prevent such a Descent of these *Meteors* downwards: For as our common Thunder and Lightening certainly do, and that not seldom, descend from the Clouds to the Earth, and make lesser Destructions there, so do some of the best Observations incline us to allow that even this, as well as others of these *Meteors*, have a little descended in their Course also. Nor in case of the original Direction downwards, do I know any sufficient Obstacle our lower Air, how dense soever, could lay in its way; the Strength and Velocity of such a *Meteor*, vastly exceeding any such inconsiderable Resistance. Yet it is to be noted,

(6.) That our late Histories of those *Meteors* of this kind, whose Heights have been measur'd, never give less than 30 Miles Altitude to any of them. Whence it appears, that the Great and Good Author of Nature

ture has generally, in the Course of his Providence, confin'd them to the upper Regions of our Air, and preserv'd the lower Parts of it, with the Inhabitants of the Earth and Seas, from the dismal Effects of them; tho' that Confinement and Preservation be provided for by Causes which no way appear to us at present.

(7.) That we accordingly have no certain Accounts of any great Destruction brought upon Mankind by such Meteors, excepting that amazing and divine Judgment on Sodom and Gomorrah, Admah and Zeboim, which the Sacred Scriptures record, and to which all the Heathen Accounts also agree. The Scriptures describe it thus: *Then the Lord rained upon Sodom and upon Gomorrah Brimstone and Fire, Gen. xix. from the Lord out of Heaven. And he over- 24, 25, threw those Cities, and all the Plain, and 26. all the Inhabitants of the Cities, and that which grew upon the Ground. But Lot's Wife looked back from behind him, and she became a Pillar of Salt.--- And the Smoak of the Countrey went up as the Smoak of a Furnace. Which is elsewhere al- v. 28. luded to also by Moses, in these Words; Deut. The whole Land thereof is Brimstone, and xxix. 23. burning Salt; that it is not sown, nor beareth, nor any Grass groweth therein; like the Overthrow of Sodom and Gomorrah, Admah and Zeboim, which the Lord overthrew in his Anger, and in his Wrath.*

Diodorus Siculus says, that Places near this Asphaltites, or Lake of Bitumen, are fiery, Diodor. and of an ill Savor, and make the Bodies of the XIX. Inhabitants sickly, and altogether short-liv'd.

Strabo says, There are many Indications of a burning Soil here: ---- which confirm the Strabo XVI. Tradition of the Inhabitants adjoining, which say, There were therein of old thirteen Cities, the Principal of which was Sodom; whose Circuit is still shewn of 60 Furlongs; and that the Lake arose from Earthquakes, with the Eruptions of Fire, and of hot and brimstony Waters: whereby the Stones took Fire, while some of the Cities were swallowed up, and others deserted by those who could get away.

Tacitus

Tacitus says, that These Plains are related
 Tacit. V. vid. to have been anciently very fruitful, and
 Plin. v. 16. with great Cities in them: but that they
 were burnt by a Blast of Thunder and Ligh-
 tening; the Footsteps of which remain: That the Land looks
 burnt, and has lost its Fertility: because all things that grew
 there, whether of their own Accord, or by Culture of the La-
 bourer, both the Herb and the Flower, when they seem nearly
 ripe, become black and empty, and seem to vanish away into
 Ashes.

Solinus says, There is a large Bay, that
 Solin. c. 36. opens itself a great way from Jerusalem,
 which was stricken from Heaven, as a black
 Soil that turns into Ashes: There were there two Ci-
 ties, Sodom and Gomorrah by Name, the Apple of
 which Places, when it seems to be ripe, cannot be chewed;
 for the paring on the outside, which is thin, contains with-
 in nothing but Soot and Ashes; which when you press it
 never so little with your Hand, sends out Smoak, and va-
 nishes away into Dust dispers'd by the Wind.

Now how exactly these Descriptions agree to a
 Countrey destroy'd by such a terrible Meteor as this,
 I dare appeal to all sober and considerate Naturalists:
 while the Rain of Fire and Brimstone, or of Brimstone
 on Fire, with nitrous Salts intermixed, is here literally
 true: while the Smoak like the Smoak of a Furnace, is al-
 so literally true: it being evident in Fact, that all
 Vulcano's, great Guns, and such Meteors as these, di-
 rectly leave a mighty Smoak after their Explosion:
 while the Salt Lake itself would easily thence arise, by
 the Penetration of such fierce and fiery Particles into
 the Bowels of a Countrey, which was
 Gen. xiv. 10. full of Slime-pits already, and so prepared
 to take Fire: while it would thus easily destroy itself
 by a Subversion, an Overthrow, or an Earthquake, and
 thereupon admit the Waters of the River Jordan, from
 the neighbouring Sea of the Plain, and would infect them
 with its nitrous and sulphureous Vapours, and so become
 one great Salt, or Dead Sea, for all future Generati-
 ons: while the Remains of all this would naturally pro-
 duce such a barren Soil, full of Smoak and Ashes, as
 we

we find adjoyning to the Salt Sea, by the foregoing Descriptions. This nitrosulphureous Shower would also naturally fall on *Lor's Wife*, while she staid a little behind, *looking back*, as not fully believing God's threatening concerning this terrible Destruction, and would not only kill her in an instant, but render her Body immediately stiff and fixed, in the same Posture wherein she was when it fell on her; which is no uncommon Circumstance with us, when any Persons have been kill'd by Lightening; and which would render her a standing *Pillar of Salt*, of Nitrous Salt, in a literal Sense; however, a *Pillar of Salt* for Perpetuity, or a lasting Monument of this terrible Judgment for future Generations. And so it prov'd, for it was still in Being several Years after our Saviour's Death, as the *Jewish Historian Josephus* himself assures us, and whose Words seem to imply, that himself had seen it also.

See Luk. xvii

32.

Joseph. Antiq.

I. 12.

Note (8.) That one great ordinary Intention and Use of these Meteors seems to be the same with that of the Tides for the Sea; and of Storms, whether of Wind, or of Thunder and Lightening, for the lower Air; I mean not only the agitating the Air, but chiefly the purging and purifying of it, by spending and consuming such noxious Steams and Exhalations, as otherwise might be pernicious to Mankind, to the Bruit Animals, and to the other Inhabitants thereof, if such there be. I say, this seems to me at least one of the Uses of Thunder and Lightening, both here below, and there above; without presuming to deny that there may be other Uses of the same, or that these, as well as other Meteors, may be farther intended by Providence for Purposes which we have at present no certain Means of discovering. It does not follow, that because the fixed Stars are very useful to us in Astronomy, that therefore Providence only designed them for that End. And the Case is the same in other Instances.

Note (9.) That there seem to have been of late more uncommon Meteors seen than have been usual

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in the like Space of Time. Thus we have had at least Eight or Nine of the Meteors of this kind taken Notice of in these Parts of the World, within 53 Years; while we know not where to find so many in a much longer Space in any elder Histories. Thus also there have been more frequent and remarkable *Aurora Boreales*, or *Northern Lights*, observ'd within somewhat more than three Years last past, than appear in our Historians, in a much longer Space. To say nothing of that pale Light like Twilight, which is chiefly seen between the Horizon and the *Pleiades*, about the End of *February*, and Beginning of *March*, which some have thought to be peculiar to the last 70 or 80 Years. Nor can it well be said, that all this has happened only by the Negligence of the elder Writers in transmitting such Things to us: Since, on the contrary, they have generally been but over Superstitious in setting down such strange Appearances, and of noting how ominous they thought them to Mankind.

Note (10.) That it no way appears that the frequenter Phænomena of these sorts, have yet had any ill Influence on the natural World. The Seasons, the Air, with the Fruits of the Earth, and the living Creatures, seeming in general to have received hitherto no Damage thereby. And certainly, if they tend to purge the Air, as I imagine, they may have received no small Benefit from them. Nay indeed, in case they should be deriv'd from any considerable or general Change in our Air of late, I should think it more probable that such Change was for the Benefit and Advantage of the same, than the contrary.

Note (11.) That we have no reason to suppose that Comets, or Northern Lights, or these Meteors before us, with the like more unusual Phænomena of Nature, are properly and generally *ominous*, or directly forebode any future Judgments to the World, or to particular Nations, or Parties therein, as the Vulgar are apt to imagine. They are indeed, with other celestial Phænomena, naturally Invitations to the abstracting our Minds from continually poring on things below; they call on us to look upwards, to the Works of
God

God that are above us ; to his superior Providence, and to a proper Dependence on him. They preach to us this Doctrine, That God has it always in his Power to preserve or destroy the World, and all the Creatures therein, as he pleases; and this without any new Miracles. But they are, I think, of themselves, and generally speaking, no proper Indications of impending Judgments, or of God's Will to punish or destroy any Part of his Creatures. It may be indeed justly esteem'd a great Sign of the Guilt and conscious Wickedness of Mankind in general ; that all such extraordinary Phænomena are still interpreted to the worse Sense, as Fore-runners of Wars, Famines, Plagues, &c. but they are not, I believe, any Signs that God is really and particularly at such times bringing those or the like Judgments upon them. However, I have so fully spoken my Mind of this Matter, and of the Limitations and Restrictions thereto belonging, in my Account of the former surprising *Meteor*, *March 6. 1716. pag. 74.-77.* that I shall not repeat it here, but refer the Reader thither, who desires farther Satisfaction. I conclude with one more important Observation, which is this:

Note (12.) That we ought here to observe, and to acknowledge the good Providence of God, the great Author of universal Nature, of the Air in particular, with its surprising Wonders ; and the great Disposer and Director of them all, in usually confining the terrible *Meteors* of this kind to the upper Regions of the Air, and not permitting them to descend low enough to hurt us here below. And this deserves more particularly our regard, because we know of no mechanical Causes that can hinder their Direction downward ; and because we know that ordinary Thunder-blasts are frequently so directed, and this sometimes to the terrible Destruction of Buildings and Animals here below. Let us but consider, what has been above shewn, how certainly such a descending Ball or Whirlwind of Fire and Brimstone as this, which was a full Mile in Diameter, and mov'd at the rate of at least 2000 Miles in a Minute, might have conquer'd all the Re-

sistance of our lower Air ; and in a moment, before it could have been in the least foreseen, or provided against by any, might have destroy'd such a City as London it self. How inevitably, how immediately, such a famous Emporium might then

If. i. 9. have been as Sodom, and like unto Gomorrah ; and not one Person might have escaped to tell the sad News to the rest of the World ? This would not seldom be the natural Result of such Blasts here below, which are frequently seen above, did not the divine Providence, by some Means un-

known to us, restrain their Course, Ps. civ. 9. and fix them their Bounds which they cannot pass ; and say, hitherto shall ye come, and no further ; and in such a Place above Job xxxviii. shall your proud Waves, or Blasts be stayed. II.

This is the rational, the religious Consequence ; this is the just and the pious Inference, which the Consideration of such surprizing Meteors, such wonderful Works of him that dwelleth in the Heavens naturally suggests to us. I therefore end my Discourse on this, nearly as I did Song of the that on the former Meteor ; O ye Fire three Children and Hear, O ye Lightenings and Clouds ; v. 43, 50, 56. O ye Children of Men, bless ye the Lord ; praise and exalt him above all for ever.



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POSTSCRIPT.



Have just now got some good Observations of this Meteor from our famous Observatory at *Greenwich*, and what Accounts were there received, viz. that to us about *London* it arose from or but little under the Seven Stars, which were then half a Point from the West to the North, at the Altitude of 22° or 23° , that it proceeded above 40° upon the Horizon, till it came under the Sword of *Orion*, near the South West, and about the Altitude of 15° ; that the time of its Appearance was nearly 11' after 8, and that it lasted about 6'', making a hissing Noise as it passed along. All which confirms what I have already advanc'd, and particularly implies what I have noted above, That the Meteor had the greatest Elevation at first, or was not much less than 50 Miles high, which is nearly the utmost Limit of our Atmosphere; that it gradually descended lower till it came over *Devonshire*, where it was about 39 Miles high; and that where it brake, over the Sea, and over *Bretaign* in *France*, its Altitude could not be very much above 30 Miles.

As to the Monastery burnt in *France*, it was the Day before the Appearance of this Meteor, and so had no Relation to it. And the like is to be said of some other Accidents elsewhere, none of which appear to have at all been occasion'd by it.

May 25.
1719.

W. W.



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